Ms. Chandler is a middle school special education teacher working in a low-incidence classroom. She currently teaches 12 students with intellectual disability and autism spectrum disorder in her classroom. Ms. Chandler feels that her students struggle to complete tasks independently and that they rely heavily on adult assistance across academic and functional tasks.

At the beginning of the school year, Ms. Chandler received three iPads for her classroom to enhance instruction and learning. She heard wonderful things from colleagues about using iPads with students with disabilities, including the use of iPads for video-based instruction. Ms. Chandler thinks that video-based instruction would be great for her students and would promote less reliance on others for assistance. She is excited to use the technology in her classroom and wants to learn how to use the iPads to provide instruction to her students. The only caveat is that Ms. Chandler is a novice at creating video-based instruction, let alone creating instruction using a device with which she is unfamiliar.

Video-based instruction is technology-based instruction delivered through video clips in which a human model demonstrates target behaviors (Rayner, Denholm, & Sigafos, 2009). Video-based instruction can be used to teach a variety of skills, including social communication and behavioral and functional skills (Cihak & Schrader, 2008). Implementing video-based instruction offers many advantages, such as increased student independence and decreased reliance on adult assistance, consistent instruction for students, and minimal training for adults who assist with video-based instruction (Rayner et al., 2009). Despite the advantages, preparing video-based instruction can be time-consuming without the background knowledge needed to create and implement this form of instruction.

Many special educators, such as Ms. Chandler, recognize the effectiveness of video-based instruction but are overwhelmed by the process of creating videos, especially when it involves complex technology (Carnahan, Basham, Christman, & Hollingshead, 2012). Despite their interest, teachers do not often have a clear understanding of how to begin and fully execute the process of creating video-based instruction for their students. The lack of knowledge regarding the creation of video-based instruction can be attributed to a multitude of factors, including lack of technology training or support and lack of preparation time (Mechling, Ayres, Foster, & Bryant, 2013).

Given the limited amount of time that teachers have to plan for instruction (Mechling et al., 2013), identifying techniques to increase efficiency when implementing video-based instruction is essential. Whereas numerous technologies can be used to create video-based instruction (e.g., video recorder, computer, camera), mobile technologies such as the iPad enable teachers to record, edit, and play videos all on one device. The term iDIY, as used in the title of this article, presents the idea that teachers can use iPads to create video-based instruction themselves (i.e., do it yourself).

Despite the all-in-one capacity of these current commercially available devices, teachers must still be knowledgeable about the key elements of video-based instruction, including how to create and implement it. The purpose of this article is to provide teachers with information on how to develop video-based instruction solely using the iPad and what elements teachers should consider during implementation.

Creating Videos for Video-Based Instruction

There are numerous steps to consider when creating video-based instruction; Figure 1 provides a flowchart of 10 steps and five considerations for creating and implementing video-based instruction. Before the video is recorded, decisions must be made regarding formatting, who will be featured in the video and how that person will be viewed, what permissions need to be obtained if recording students, where the recording will take place, and what technology will be used to make the video. Once these steps are completed, teachers are ready to film and edit videos for use with their students. Teachers can follow the 10 steps provided as a guide...
to developing video-based instruction using the iPad. The first five steps represent the preparatory steps in the flowchart, whereas Steps 6 to 10 represent the five steps in making the video.

**Step 1: Choose a Format**

The first step when using video-based instruction is to decide which form is suitable for the student. There are two commonly used formats with regard to the sequence of delivering video content: video modeling and video prompting. With video modeling, students are shown a video demonstrating the task in its entirety before they are required to perform it (Horn et al., 2008). The advantages of video modeling include less editing time and the ability to view task performance as a whole (Cihak & Schrader, 2008). However, for tasks that are new or complex, video prompting may be a more suitable choice. With video prompting, a task analysis (see Step 2) is used to break down the video into multiple clips (Horn et al., 2008). Students watch a single clip and then perform that step before being shown the next clip. Video prompting typically requires less adult instruction and tends to yield faster acquisition rates for more complex tasks (Cannella-Malone et al., 2006).

**Step 2: Create a Task Analysis**

For video modeling and video prompting, the second step is to create a task analysis. A *task analysis* takes a task and breaks it down into a sequence of small teachable steps (Snell & Brown, 2011). With the video-modeling format, the purpose of the task analysis is to assist teachers in making certain that steps are not missed when performing the task in its entirety for the video. For video prompting, each task analysis step equates to one video clip. For example, if a task is broken down into 12 teachable steps, then there are 12 video clips in the video-prompting video. Table 1 provides examples of task analyses for use with two mobile applications, or apps. Although the task analyses in Table 1 are not student-oriented, they demonstrate how a procedural activity can be broken down into small teachable steps; teachers can refer to these task analyses when developing their own teachable steps for student tasks.

**Step 3: Choose a Model**

For the next step, teachers need to determine who will model the task in the video. The focal student (i.e., self as model) or another adult or peer (i.e., other as model) can be used as the model in the video (Cihak & Schrader, 2008; Sherer et al., 2001). When focal students are the model, they have the opportunity to practice the task multiple times and see themselves performing positive behaviors, both of which can increase confidence in a task (Darden-Brunson, Green, & Goldstein, 2008). However, using focal students as models can be challenging, especially for complex tasks.
### Table 1. Task Analyses for Using Two iOS Mobile Apps

**Editing using the iMovie app**

1. Open iMovie.
2. Click “+” (on the top right corner) to create a new project.
3. Select “Movie” and click “Create Movie.”
4. Click “Camera” (on the bottom right corner) to use the iPad camera to collect movie footage.
5. Start recording (you can record audio simultaneously or add it later).
6. Stop recording.
7. Play footage. If not OK, select “Retake.” If OK, select “Use Video.”
8. The footage will drop down into your timeline.
9. Split a clip by moving the vertical line to the segment of the clip that you want split, and tap on the clip to split it.
   a. Trace the line with your finger, or select “Split.”
   b. The clip will then split into two different segments.
   c. Double click any item in the timeline to delete it.
10. Delete background noises in the footage by tapping the clip once, and select “Audio” (on the bottom left corner) to turn off sounds or select “Detach” and delete audio.
11. Click the microphone icon (on the bottom right corner) to record a voice-over.
12. Press “Record”; after a countdown from 3-2-1, record a voice-over.
13. Push “Stop” once you complete the voice recording.
14. Select “Review” to evaluate the voice-over.
15. Select “Accept” if you approve.
16. Push “Play” to review the video with added voice-over in the timeline.
17. Select the “<” icon on the top left corner to finalize the video.
18. Select the “Share” icon to save the project to “Cameral Roll” or upload to a website (e.g., YouTube).

**Saving video clips to Keynote app**

1. Open Keynote.
2. Click “+” (on the top) to create a new project.
3. Select a theme (e.g., “White”).
4. Click “+” (on the bottom) to create a new blank page.
5. Click “+” (on the top) and select “Media” to open “Camera Roll.”
6. Select target video clip and select “Use.”
7. The video will be inserted to the blank page.
8. Repeat Steps 3 to 7 to select clips to create video prompting.
9. After inserting all clips, select “Play” (on the top) to play video prompting step-by-step by tapping the screen.

*Version 2.0.
students may increase the time spent filming and editing because teachers will need to demonstrate or guide students in how to perform target tasks during filming and trim out unwanted segments during editing (Ayres & Langone, 2007; Cihak & Schrader, 2008). In addition, videos featuring self-as-model cannot be reused with other students, for confidentiality reasons (Cihak & Schrader, 2008). When a peer is used, video release forms are required (Ayres & Langone, 2007). Using an adult as the model may be a more favorable alternative for efficiency and practicality (Cihak & Schrader, 2008). Despite advantages and limitations of both approaches—self as model and other as model—the type of activity that the video-based instruction is targeting plays a major role in deciding who will model the video. If video-based instruction is used to target inappropriate behaviors (e.g., hitting, screaming, or tantrum-like behaviors) or social behaviors (e.g., appropriate communication exchanges), self as model is a better choice. An adult model is sufficient for daily living activities, such as food preparation, hygiene practices, and putting away grocery items (Ayres & Langone, 2007).

Step 4: Choose a Perspective

After selecting a model, teachers must decide what perspective the video should present: first person or third person. With a first-person point of view (i.e., perspective from the model’s point of view), only body parts performing tasks are shown in the video (Rayner et al., 2009). A third-person point of view (i.e., perspective of an observer) shows the model’s whole body performing the task. Ayres and Langone (2007) compared the two perspectives and concluded that no one perspective was superior to the other. Despite the existence of only a few studies that directly compare the two perspectives, both are commonly used and are effective, and no studies have demonstrated that one perspective is superior over the other (Ayres & Langone, 2007; Rayner et al., 2009). In terms of choosing a perspective, Ayres and Langone recommended that teachers should generally use the first-person point of view for teaching functional skills and the third-person perspective for demonstrating positive behaviors and social interaction. Some functional skills (e.g., shaving one’s face) require use of the third-person perspective. Likewise, under certain conditions, the first-person perspective is a better option for particular students, such as students with autism spectrum disorder, for the following two reasons: First, it improves chances of the target student not becoming distracted by irrelevant information (e.g., the model’s face; Hine & Wolery, 2006); second, students need to focus on only the stimuli. Students with certain disabilities (e.g., autism spectrum disorder) may struggle with discriminating between a model and the stimuli (Ayres & Langone, 2007).

Step 5: Choose and Control Environmental Conditions

After deciding on the appropriate model and perspective, the next step is to determine whether the video will be recorded in natural settings (e.g., grocery store) or simulated settings (e.g., an adapted room at school that has been set up to look like a grocery store). Whenever possible, video recordings should be done in natural settings, because they have been shown to typically result in better generalization of targeted skills; however, if recording in a natural setting is not feasible, a simulated setting can be used (Darden-Brunson et al., 2008). It is important to ensure that the recording environment presents minimal distractions, especially in a natural environment where teachers typically have less control. If background noises are either distracting or too loud to record audio cues on-site, teachers can add them after filming. Zooming in on the target model and task—or recording up close if zoom is not available—is another method of creating a video that helps students focus on the target task, especially among students who have difficulty focusing on relevant information.

Step 6: Prepare for Filming

Before starting to film video-based instruction, teachers need to consider some subsidiary actions to ensure smooth filming—for example, contacting persons to secure permission to film in a specific location, obtaining consent forms from students to be used as models, setting up an environment, performing a dry run (see Figure 2). Teachers or other personnel in charge of filming also need to determine which apps best support their filming needs. For example, the iPad’s native Camera app does not support a zoom-in function during filming, whereas Video Zoom Pro ($1.99) and Movie Pro ($2.99) both feature a zoom-in function during filming.

Step 7: Film the Video

Using iPads to film videos appears to be a simple process (i.e., just aim and turn on the app); however, the quality of the video can be easily affected. To film a high-quality video, the individual recording the video must remain as stable as possible, especially when an iPad tripod is not available. Because wobbles are almost inevitable, teachers can use certain apps to stabilize the video during filming (e.g., Luma Camera, free) or after filming (e.g., Movie Stiller, $2.99). Likewise, the individual who is filming the video should ensure that nothing—including fingers—blocks the camera.

Step 8: Edit Video-Based Instruction

After filming has been completed, teachers can retrieve the video clips from an album in the Photo app called Video. To edit the video, teachers can trim video clips by selecting segments via the timeline located at the top. If teachers need to perform higher-level editing (e.g., adding audio), the iMovie app ($4.99) is an option for basic editing (e.g., trimming, adding text and audio cues, eliminating background sounds), although it does not have the zoom-in
Step 9: Save Video to a Playing App

Once a video is recorded and edited, it is ready to play. For the iPad, several apps are capable of playing videos for video modeling, including the built-in Photo app, which is sufficient for video modeling. For video prompting, clips can be embedded and played from the Keynote app ($9.99). We summarize some common apps to create video for iPads in Table 2. The iOS apps listed in Table 2 are easy to operate, or they have an online or in-app tutorial (see Table 3 for troubleshooting issues).

Considerations for Implementing Video-Based Instruction

After creating videos, teachers need to consider other factors for implementation, such as where, when, and how instruction will take place. The following considerations represent the bottom “Using video” steps in the flowchart (see Figure 1).

Where Will Teachers Use Video-Based Instruction?

There are two types of environments in which a focal student performs a target task: in vivo (i.e., natural) and simulated settings. An in vivo environment is a place with real materials in the criterion environment (e.g., a grocery store; Storey & Miner, 2011). A simulation environment, however, is where a student performs tasks within an environment created by teachers in a school setting. Although simulated settings do not provide natural cues as in vivo settings do, there are advantages to using simulated settings: increased opportunities to practice tasks, decreased cost and time requirements (given no need for transportation), and decreased risk factors than in a community (Storey & Miner, 2011). Between the two types of environments, in vivo settings are often preferred because they are more effective and promote greater generalization (Cihak, Alberto, Kessler, & Taber, 2004; Storey & Miner, 2011). However, teachers may experience difficulties providing students with opportunities within in vivo settings because of financial, time, and geographic constraints (e.g., rural settings). If money, transportation, or timing is a concern, teachers can combine the two types of settings. For example, teachers can start with a simulation setting (e.g., three times a week) and combine it with a natural setting (e.g., once a week or every other week) according to their community-based activity schedules. This hybrid model compensates for the shortcomings of both settings while providing significant effects on generalization and sufficient practicing opportunities for students (Cihak et al., 2004).

When to Watch Video-Based Instruction

Along with deciding where video-based instruction will occur, teachers choose when students watch it. Mobile...
technologies such as the iPad enable students to watch videos at any time before performing the task. If the video-based instruction is used to teach a task, it is recommended that students perform the target task immediately after watching the video-based instruction or at least perform it no longer than three hours after watching the instruction (Cihak et al., 2004). If the video-based instruction is used to teach or remind students of positive behaviors, teachers should consider showing the video in one of two ways. First, the teacher can set a regular schedule for students to review videos (e.g., in the morning when students get to school). Second, the teacher can show students the video before the antecedents (i.e., events that provoke a negative behavior) to decrease negative behaviors (i.e., video priming; Rayner et al., 2009). Teachers should avoid showing the video after instances of negative behavior because watching a video could become a reward to some students who enjoy watching videos (Sherer et al., 2001).

Table 2. iOS Apps for Filming, Editing, and Playing Videos

<table>
<thead>
<tr>
<th>When: Purpose</th>
<th>Apps</th>
<th>Built-in</th>
<th>Price</th>
<th>Features/Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filming</td>
<td>Camera app</td>
<td>Yes</td>
<td>Free</td>
<td>No zooming during filming</td>
</tr>
<tr>
<td>Filming with zoom-in</td>
<td>Video Zoom Pro app</td>
<td></td>
<td>$1.99</td>
<td>Zooming-in during filming</td>
</tr>
<tr>
<td></td>
<td>Movie Pro app</td>
<td></td>
<td>$2.99</td>
<td>Zooming-in during filming</td>
</tr>
<tr>
<td>Filming with stabilization</td>
<td>Luma Camera app</td>
<td>Free</td>
<td></td>
<td>Stabilizing videos</td>
</tr>
<tr>
<td>Editing</td>
<td>Movie Stiller app</td>
<td></td>
<td>$2.99</td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>Photo app</td>
<td>Yes</td>
<td>Free</td>
<td>Trimming and breaking a video</td>
</tr>
<tr>
<td>Advanced editing</td>
<td>iMovie app</td>
<td></td>
<td>$4.99</td>
<td>Trimming, breaking, and combining videos; background-sound eliminating; adding audio</td>
</tr>
<tr>
<td>Playing</td>
<td>Photo app</td>
<td>Yes</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td>Video modeling</td>
<td>Keynote</td>
<td></td>
<td>$9.99</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iBooks&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Yes</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Google Drive&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dropbox&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safari</td>
<td>Yes</td>
<td></td>
<td>Playing video from shared sites&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Video prompting</td>
<td>Keynote</td>
<td></td>
<td>$9.99</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iBooks&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td>Downloading videos from shared sites to an iPad</td>
<td>Free Video Downloader Plus—Download HD video</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iVideo Downloader: Free Downloader and Manager</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video Download+</td>
<td></td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video Downloader—iBolt Downloader and Manager</td>
<td>Free</td>
<td>$0.99</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Creating an iBook requires the iBooks Author app on a Mac computer and then publishing it to the iBooks app on an iPad.

<sup>b</sup>Several apps (e.g., iCloud, Dropbox, Google Drive) are available to save and share videos in “the cloud” via secure settings. Because of possible limited Wi-Fi access, we do not recommend relying on streaming video directly from a cloud system (e.g., Dropbox or Drive).

<sup>c</sup>Because of possible limited Wi-Fi access, teachers can download videos using video-downloading apps (see last section of table).
What Teaching Strategies Can Be Used With Video-Based Instruction?

Video-based instruction can be used alone or in conjunction with other teaching strategies—such as most-to-least prompts (i.e., decreasing assistance by an adult after consecutive successful responses; Snell & Brown, 2011), least-to-most prompts (i.e., increasing assistance by an adult after an unsuccessful response; Snell & Brown, 2011), video error correction (i.e., after a student fails to successfully perform the task after watching a video, the same video clip is shown to the student a second time; Cannella-Malone et al., 2006), and time delay (Storey & Miner, 2011). Prompting and video error correction provide error correction, which is a critical component for learning because it helps students modify their behavior and it yields faster acquisition (Cannella-Malone et al., 2006). Time delay is a strategy that could decrease a student’s reliance on prompting. Teachers can use these strategies individually or in combination.

How to Fade Video-Based Instruction

After students master target tasks, teachers need to help students gradually fade their reliance on video-based instruction (Sigafoos et al., 2007). Teachers should consider what fading procedure they will be using before producing the video. In that way, teachers could save time re-creating materials for fading procedures. There are two common ways to fade video-based instruction. First, if students are using video prompting, one way to fade it out is to gradually combine clips (i.e., video chunking) to decrease the number of video-prompting cues (Sigafoos et al., 2007). Another way is to gradually convert video-based instruction into other types of self-prompting systems using different modalities, such as text, picture, and audio. An appropriate fading procedure should be chosen accordingly, based on students’ abilities and preferences (Van Laarhoven & Van Laarhoven-Myers, 2006).

How to Promote Generalization and Maintenance

Finally, teachers should check generalizability and maintenance of a task using the video-based instruction (Snell & Brown, 2011). To ensure generalization, students should use the same video-based instruction in different settings while doing the same task. After acquiring target tasks, teachers should periodically follow up

<table>
<thead>
<tr>
<th>Possible issues</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filming</td>
<td></td>
</tr>
<tr>
<td>Noisy background</td>
<td>Adding audio cues during editing.</td>
</tr>
<tr>
<td>People in the background</td>
<td>Choose a time when fewer people visit.</td>
</tr>
<tr>
<td>Not allowed to film in a store</td>
<td>Gain permission from the store manager beforehand.</td>
</tr>
<tr>
<td>Confidential issues of using a student as a model</td>
<td>Use an adult as a model.</td>
</tr>
<tr>
<td>Shaky hand during video recording</td>
<td>Place the iPad on a stable surface. If during filming, it requires the person who holds the recording device walking around, use smartphones that are equipped with an optical image stabilizer.</td>
</tr>
<tr>
<td>Editing</td>
<td></td>
</tr>
<tr>
<td>Shaky video</td>
<td>Use stabilizing apps to cancel the shaking effect before editing.</td>
</tr>
<tr>
<td>Original audio cues not audible</td>
<td>Mute original audio cues and rerecord audio cues using the iMovie app.</td>
</tr>
<tr>
<td>Playing</td>
<td></td>
</tr>
<tr>
<td>No Wi-Fi for streaming video in a community setting</td>
<td>Save videos to the iPad in a location where Wi-Fi is available before going to the community</td>
</tr>
<tr>
<td>Google Drive</td>
<td>“Star” the video beforehand (on the Google Drive app: Go to designated file → press ★ → go to file detail → make sure “Available Offline” is on).</td>
</tr>
<tr>
<td>Dropbox</td>
<td>“Star” the video beforehand (on Dropbox app: Go to designated file → press ★).</td>
</tr>
<tr>
<td>Safari (e.g., YouTube)</td>
<td>Download the video beforehand using video downloader apps (see Box 2).</td>
</tr>
</tbody>
</table>
for maintenance. In addition, to increase the maintenance of learned skills, teachers need to provide students opportunities to practice skills (Snell & Brown, 2011).

Final Thoughts

The use of technology to create and deliver instruction is common in special education. Video-based instruction is among the most empirically evaluated technology-based interventions, and newer technologies (e.g., iPads) make video-based instruction easier for teachers to use in practice. Although we reference only iPads (iOS system) in this article, the steps and key elements addressed here can be easily applied to other mobile tablets (e.g., Microsoft Surface using Windows). Ms. Chandler and other special education teachers can take advantage of commercially available technologies, such as iPads, with all-in-one capabilities to film, create, and play video-based instruction.

Once the video-based instruction is made, Ms. Chandler can share the products with other teachers after the confidentiality issues of the models are precluded. One way to share the videos is to build a video library by creating a personal website on Google Sites or YouTube (see our Google Site on video-based instruction at [https://sites.google.com/site/itavbi]). There are also educational websites, such as Edmodo (http://www.edmodo.com) and TeachersPayTeachers (http://www.teacherspayteachers.com), that promote sharing of resources among teachers. This collaboration among teachers can facilitate the use of video-based instruction in practice.

References


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